NEW CADDISFLIES (TRICHOPTERA) FROM THE SOUTHEASTERN UNITED STATES

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ABSTRACT

Six new species of caddisflies are described from Georgia, Tennessee, and North and South Carolina, two in the genus *Radema* and one each in *Chimarra, Polycentropus, Triaenodes*, and *Goera.*

Key Words: Trichoptera, southeastern United States, *Radema, Chimarra, Polycentropus, Triaenodes, Goera.*

In an effort to compile and augment a check list of caddisflies from South Carolina, collections of adults were made nightly from late March to late October, 1969, in the northwestern South Carolina mountains. Examination of but a small number of the specimens from this survey (a total collection of about 100,000 specimens) has revealed several undescribed species. Because of the interest of a number of workers in the southeastern fauna, it was decided that these names should be made available now rather than at such time as the entire collection has been determined. Three of these new species have not been found outside South Carolina, one has been discovered in both Georgia and South Carolina, one was collected in both Tennessee and South Carolina, and a sixth is from North Carolina only.

Types described in this paper are deposited in the collection of the University of Georgia at Athens.

Chimarra augusta n. sp.

This species most resembles *aterrima* and *feria* from which it differs primarily in details of the claspers and the tenth tergite.

Male: Length 6 mm. Wings, palpi, fore and hind legs, and body sclerites dark brown with head and notum nearly black. Middle femora and sides of abdomen tan. Structure typical for genus.

Genitalia as in figure 1. Eighth sternite with a transverse, setose carina. Ninth segment narrowed dorsally and with a short, triangular mesal projection on the wide sternite. Tenth tergite divided into a pair of vertical blades separated by a median, triangular membranous lobe. Dorso-lateral, sclerotized sinuate ridge on each lateral blade more strongly produced than for either *aterrima* or *feria*, especially the basal lobe of this ridge, which is higher than the two apical lobes (cf. Ross, 1944, fig. 183). Cerci small, rectangular, with scattered short setae, and situated subdorsally at the base of the tenth tergite. Clasper gourd-shaped in lateral view, with a rounded ventral portion and a curved dorsal finger set off by a deeply excavated apex. Viewed caudally, each clasper with a large dorsal spur directed baso-mesally and having no dorsal shoulder projection as in *feria*. A rounded, heavily sclerotized lobe lies immediately below this spur. Aedeagus tubular, its membranous apex bearing two long, curved sclerotized rods internally.

Female: Length 7 mm. Color and structure as for male. Genitalia similar to *aterrima* externally (see Ross, 1944, fig. 186). Bursa copulatrix (fig. 2) twice as wide as long in ventral view. Caudal margin of sclerotized portion bent anteriorly such that the central clear area seen in *aterrima* and *feria* is not visible in ventral view.

Holotype–Male; Chauga River near Whetstone crossroads, Oconee County, S. C.; August 11, 1969; J. Morse. Paratypes–same data as for holotype, 39♂ 16♀.

Polycentropus carlsoni n. sp.

This species belongs to the *maculatus* group in which it most closely resembles *blicklei*, differing in the stockier clasper process, the inflected apex of the clasper body, the more bent and constricted aedeagus, and the narrower base of the cercus.

Male: Length 6.5 mm. Head, notum, and abdominal tergites brown. Warts of head and notum pale, usually with light brown hair. Bases of wings and warts on posterior dorsum of the head with dark brown hair. Abdominal sternites cream. Antennae, palpi, and legs pale with short, light brown hair. Wings indistinctly spotted with various shades of light brown hair and with a darker stigma. Structure typical for genus.

Genitalia as in figure 3. Ninth sternite wide, similar to that of *blicklei* (see Ross & Yamamoto, 1965, fig. 5). Claspers tapering gradually from the base and inflected mesally at the apex. Clasper process with a very short stalk and a well differentiated apex deflected posteriorly such that the rugose tip is concealed behind the clasper body in lateral aspect. Cercus curved ventrad similar to that of *maculatus* (see Ross, 1944, fig. 243), but with its base narrow, the mesal lobe projecting slightly beyond the ventro-posterior margin of the lateral lobe. Aedeagus with a bulbous base set off from the tubular distal portions by a constriction. Apex bent more sharply ventrad than for *blicklei*, its subapical membranous area wide on the ventral margin.

Holotype–Male; Wildcat Creek, Clemson, S. C.; April 23, 1968; P. Carlson. Paratype–same data as for holotype, 1♂ (left clasper broken).

I take much pleasure in naming this species for its collector, Mr. Paul H. Carlson, whose enthusiasm for the aquatic insects has been instrumental in the conduct of this study.

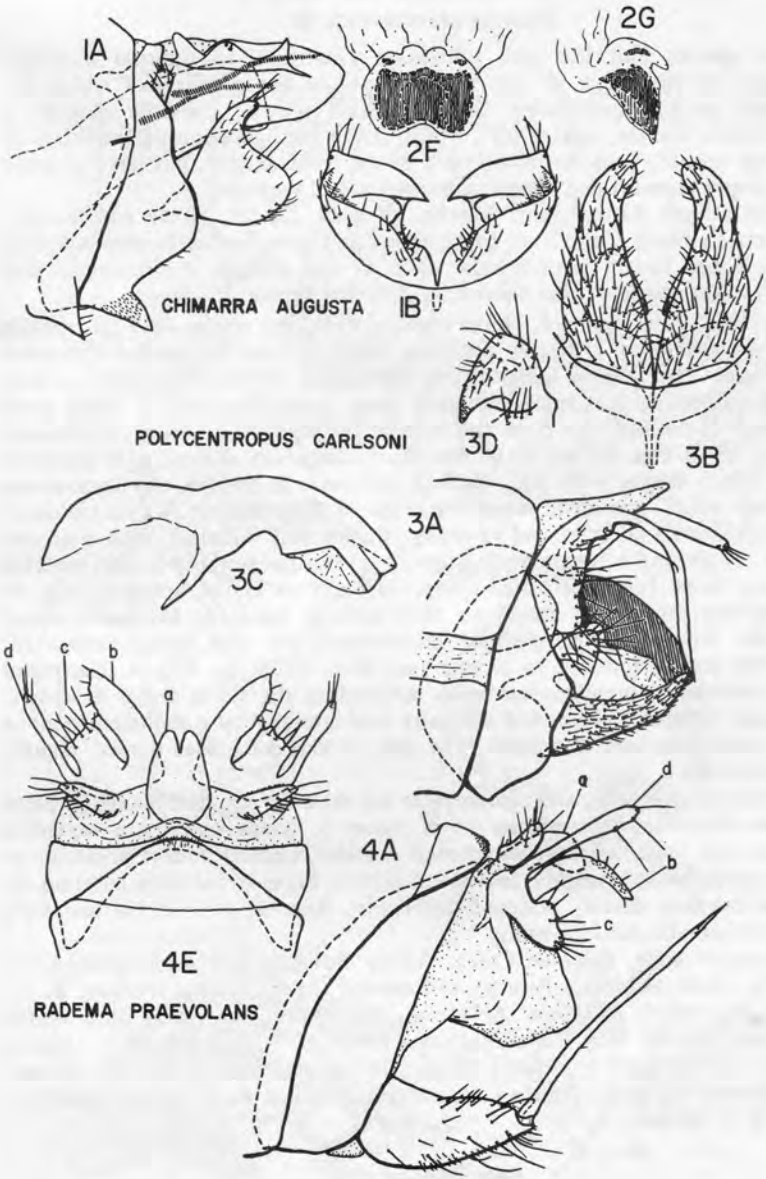

Fig. 1-4 Caddisfly genitalia. 1A, *Chimarra augusta* male, lateral view; 1B, claspers, caudal view. 2F, *C. augusta* female bursa copulatrix, ventral view; 2G, lateral view. 3A, *Polycentropus carlsoni* male, lateral view; 3B, claspers, caudal view; 3C, aedeagus; 3D, right clasper process. 4A, *Radema praevolans* male, lateral view; 4E, dorsal view.

Radema praevolans n. sp.

This species and the one following constitute an unusual southern extension of the range of this genus, most of the members of which are restricted to colder climates. Both of these species resemble *incerta*, a northeastern species, but differ from it in the configuration of the lobes of the tenth tergite. They resemble *nigra* in the tenth tergite, but have a longer basal clasper segment and a more spine-like apical segment.

Male: Length 8.0-9.0 mm. Sclerites of head, thorax, coxae and femora, and genitalia black. Antennae, palpi, tibiae and tarsi, and abdominal sclerites brown. Wings brown with a light mark at the oblique sc-r crossvein and another at the apical cubital crossvein. Structure typical for genus.

Genitalia as in figure 4. Ninth sternite wide, the tergite with its anterior portion overlapping a narrow posterior band to form a rounded transverse ridge across the tergite. Claspers two-segmented, the basal segment conical, tapering distally; the apical segment long, spine-like, with a slight bend one-third of the distance from the base of the segment (cf. *nigra*, Betten and Mosely, 1940, figs. 87 and 88). Cerci short, irregularly shaped, with scattered setae. Tenth tergite with four pairs of processes as follows: (a) dorso-mesal processes short, rounded, fused for most of their length; (b) ventro-mesal processes curved laterally and ventrally, transversely widened, with a sinuate lateral margin and a rugose ventral apex; (c) ventro-lateral processes variable in shape, some forms broadened dorso-laterally as in the holotype (fig. 4) with others ranging in shape to that seen in figure 6; (d) dorso-lateral processes long, slightly clavate. Dorso-mesal (a) and ventro-lateral (c) processes greatly reduced in *incerta* (see Ross, 1938, fig. 47). A sclerotized band traverses a membranous mass subtending the tenth tergal processes. Aedeagus tubular, surrounded ventrally and laterally by a semimembranous sheath and protected laterally by a pair of vertical blades curved slightly dorsad apically.

Female: Color, size, and structure as for male except that maxillary palpi are five-segmented. Terminalia as in figure 5. Ninth and tenth segments annular with tenth segment lengthened dorsally. Genital pocket posterior to bursa copulatrix trapezoidal in ventral aspect. Bursa ovoid with an elongate median opening sharply widened anteriorly. Anterior and lateral processes support a membranous covering.

Holotype–Male; Eastatoe Creek, Rocky Bottom, Pickens County, S. C.; April 4, 1969; J. Morse. Paratypes–Eastatoe Creek, Rocky Bottom, S. C., March 30, 1969, J. Morse, S. Morse, B. English, 1♂; same data as for holotype, 53♂ 5♀; East Fork Chattooga River, U. S. Fish Hatchery, Oconee County, S. C., April 9, 1969, J. Morse, 2♂; same, April 14, 1969, J. Morse, 2♂; Chimney's Camp, Smokey Mountains National Park, Tenn., April 21, 1949, W. E. Ricker, 1♂.

Radema rossi n. sp.

This species most closely resembles *praevolans* preceding, differing in the straighter, narrower ventro-mesal processes (b) and more curved apical clasper segment.

Male: Size, color, and structure as for *praevolans*. Genitalia as in figure 6. Ninth segment shaped similar to that of *praevolans*. Claspers with a conical base segment and with a long, spine-like apical segment gradually curved

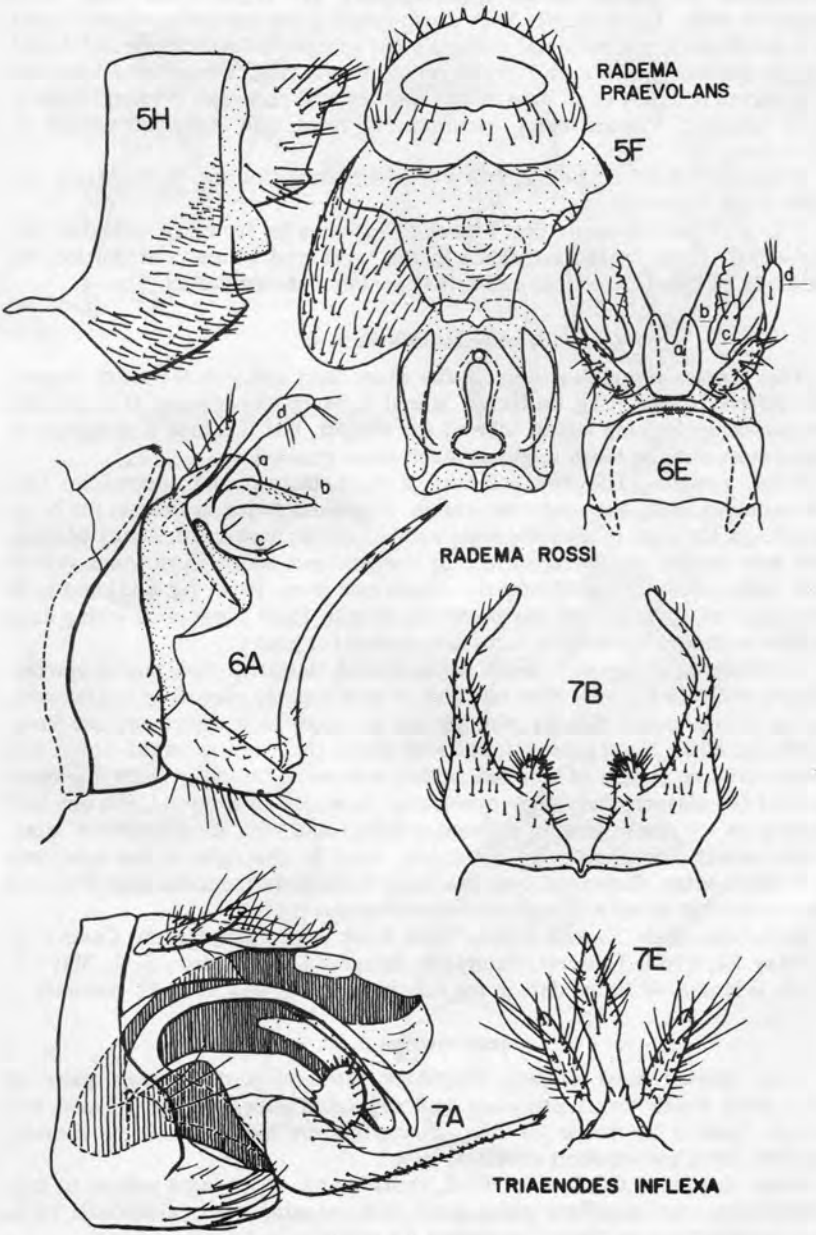

Fig. 5-7 Caddisfly genitalia. 5H, *Radema praevolans* female, lateral view; 5F, ventral view. 6A, *R. rossi* male, lateral view; 6E, dorsal view. 7A, *Triaenodes inflexa* male, lateral view; 7B, claspers caudal view; 7E, tenth tergite, dorsal view.

throughout its length to an approximately 45° angle. Cerci long, with scattered setae. Tenth tergite with dorso-mesal lobes (a) not so closely fused as in *praevolans*; ventro-mesal processes (b) straight in both lateral and dorsal aspects and not so wide as in *praevolans* in dorsal view; ventro-lateral process (c) a curved rod, not at all broadened; dorso-lateral processes (d) long, slightly larger apically. Ventral band, membranous mass, and aedaegus similar to *praevolans*.

Holotype–Male; on bridge, Old Fort, McDowell County, N. C.; March 26, 1964; Ross, Stannard.

It is with great pleasure that I name this species for its senior collector, Dr. Herbert H. Ross, whose assistance in this work and whose contributions to the study of North American caddisflies are beyond calculation.

Triaenodes inflexa n. sp.

This species resembles *tarda* in the short cerci and pointed tenth tergite, but differs in the long, inflected lateral lobe of the clasper. It resembles *marginata* in the long lateral lobe of the clasper, but this lobe is straighter in this species and the tenth tergite is much more pointed.

Male: Length 11.5 mm. Sclerites of head, thorax, and appendages tan. Membranous areas and abdomen cream. Flagellum twice as long as the body and wings, the ends of each segment with a narrow, dark band. A tuft of long, pale hair lies on the dorsal surface of the enlarged scape. Fore wings yellow with light patches situated similar to *tarda* (see Ross, 1944, fig. 863) and with two spots of dark hair on the posterior margin. Hind wings clear with a dark sclerite in the third anal cell. Structure typical for genus.

Genitalia as in figure 7. Ninth segment with sternite broad, tergite narrow. Clasper with long lateral lobe straight, or only slightly curved, in lateral view, and inflected mesad apically, though not so much as in *marginata* (see Ross, 1944, fig. 850). Mesal lobe rounded with short, thick spines on the dorsal and mesal surfaces. A pair of long sclerotized rods extend dorsally from the mesal base of the claspers and curves posteriorly as in related species. Cerci one half as long as the tenth tergite, pointed apically, and with long scattered setae. Tenth tergite asymmetrically lanceolate, bent to the right at the base, and with short setae. Aedeagus long, gradually broadened from the base in lateral view, and with its apex thrown into membranous folds.

Holotype–Male; Carrick Creek, Table Rock State Park, Pickens County, S. C.; May 21, 1969; J. Morse. Paratypes–Burgess Creek, Salem, S. C., May 19, 1969, J. Morse, 4♂; same data as for holotype, 1♂.

Goera townesi n. sp.

This species most closely resembles *calcarata* with its two pairs of sclerotized tenth tergal processes and separated lobes of the clasper, but differs from it in details of these characters, its lighter color, its shorter, stockier cerci, and its short maxillary palpi.

Male: Length 7.0-7.5 mm. Head, thorax, and appendages yellow to tan. Three-segmented maxillary palpi short, not reaching vertex in frontal view. Wings uniformly tan. Structure typical for genus.

Genitalia as in figure 8. Ninth tergite very wide subdorsally and reduced on the meson. Claspers with mesal process wide basally, its mesal margin straight, and its lateral margin separated from clasper body more strongly than for

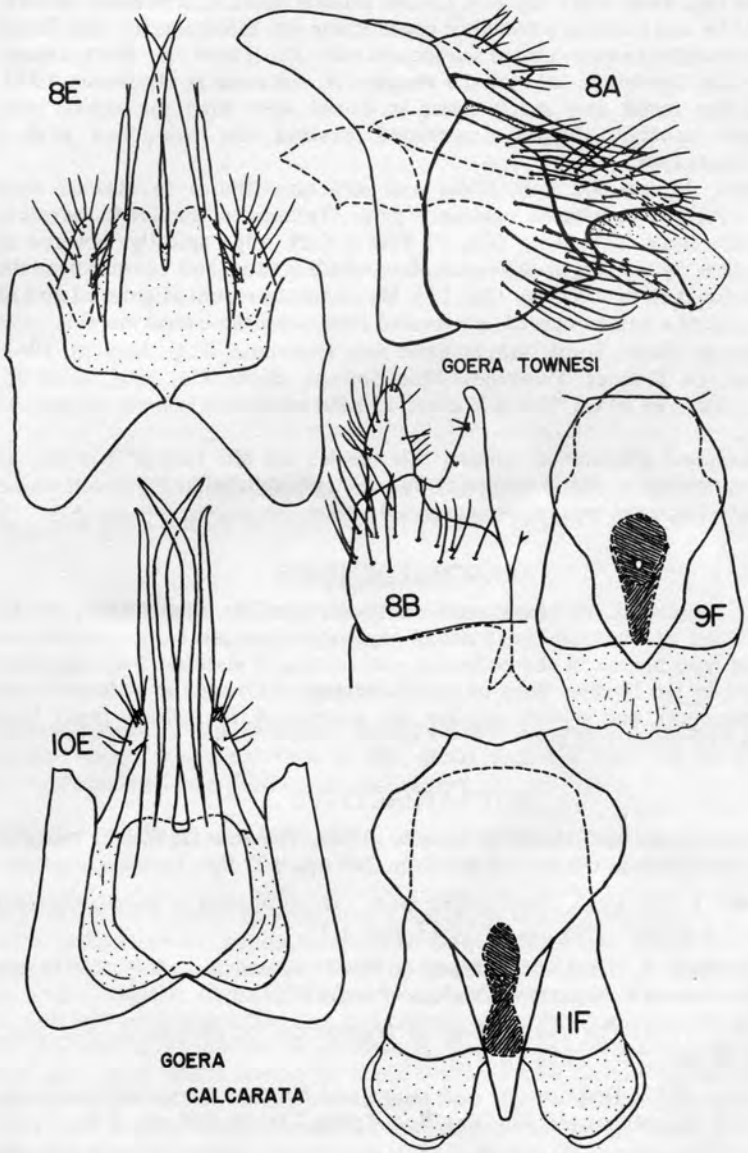

Fig. 8-11 Caddisfly genitalia. 8A, *Goera townesi* male lateral view; 8B, clasper, caudal view; 8E, dorsal view. 9F, *G. townesi* female bursa copulatrix, ventral view. 10E, *G. calcarata* male, dorsal view. 11F, *G. calcarata* female bursa copulatrix, ventral view.

calcarata (see Ross, 1947, fig. 40). Lateral process short. Cercus short, stocky, not rod-like and without a preapical constriction (cf. *calcarata*, fig. 10). Tenth tergite divided into two pairs of sclerotized rods, the lateral pair short, usually shorter than the lateral lobe of the clasper (cf. *calcarata* in Carpenter, 1933, fig. 8), the mesal pair much wider in dorsal view than the lateral pair. Aedeagus turbular, slightly constricted beyond the base, and with a membranous apex.

Female: Length 9.3 mm. Color and structure similar to that of male except with five-segmented maxillary palpi. Terminialia similar to *calcarata* externally. Bursa copulatrix (fig. 9) with a dark ridge apically, covered in ventral view by a sclerotized ventral plate which is short and broader near the anterior tip than in *calcarata* (fig. 11). Membranous region at anterior end of bursa without a pair of curved, sclerotized rods along the lateral margins.

Holotype–Male; South Saluda River near Cleveland, S. C.; May 23, 1969; J. Morse, G. Townes. Paratypes–Blue Springs, Harris Co., Ga., April 26, 1969, at light, U. of Ga. Ent. 875 class, 15♂ 6♀; same data as for holotype, 4♂ 1♀.

I take great pleasure in naming this species for Mr. George Townes, an ardent naturalist at whose home this species was captured and through whose generosity this work was largely advanced.

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